

ABSTRACT

Interleaving methods and apparatus are disclosed for an in-band on-channel digital audio broadcasting system. The guard periods that separate any two adjacent symbols in a conventional OFDM system can provide a mechanism for OFDM frame synchronization. The guard period of successive OFDM frames is utilized to establish one or more unique positive or negative patterns and thereby provide a mechanism for interleaver synchronization. By proper positioning of the guard period patterns, one or more particular portions of each interleaver block are identified, such as the beginning and midpoint of each interleaver block. The present invention identifies the beginning of each interleaver block, for example, by positioning the fourth negative cyclic prefix with OFDM frame zero (0). The present invention can optionally identify the midpoint of each interleaver block, for example, by positioning the fourth negative cyclic prefix with OFDM frame 206. The beginning of an interleaver block can be distinguished from the midpoint using a unique cyclic prefix pattern. A receiver monitors the incoming data stream for a synchronization pattern to (i) establish interleaver synchronization, (ii) detect when synchronization is lost, and (iii) detect and correct a false synchronization.

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